origin, whereas in the latter, the chest alone is devoid of scales. Other differences observed in *H. palaniensis* as compared to specimens of *H. joshuai* collected and studied from Kalakad are as follows: The body is more slender in *H. palaniensis* (body depth 5.83 in SL as against 4.45 (3.92-5.56) in SL in *H. joshuai*); head more compressed (head depth 1.81 in its length vs. 1.59 (1.27-1.76); head is longer 4.24 vs. 3.53 (3.09-3.92) in SL; caudal peduncle slender 1.64 vs. 1.24 (0.92 - 1.60) in its length; eye smaller and snout longer in proportion to head length, eye diameter 2.69 vs. 1.65 (1.27 - 2.28) in length of snout; eye 5.78 in head length vs. 4.42 (3.40-5.75) in head length in *H. joshuai*.

Ecology: *H. palaniensis* co-exists with *Garra hughi* Silas, another species, characterised by the absence of scales along the mid-dorsal streak and the ventral region. The loss of scales in these two species is probably due to convergent evolution, the scaleless dorsal surface offering least resistance to torrential mountain currents and the scaleless ventral surface offering broader surface for better adhesion to the rocky bottom.

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THE GENUS *MACROCHELES* LATREILLE (ACARINA : MACROCHELIDAE) IN INDIA. 4. TWO NEW SPECIES ASSOCIATED WITH DUNG BEETLES (COLEOPTERA: SCARABAEIDAE) FROM SOUTH INDIA[1]

R.K. ROY [2]

(With twenty text-figures)

Two new species of *Macrocheles M. punctovariata* and *M. sisiri* are described from South India.

INTRODUCTION

Phoretic relationship is common among members of the genus *Macrocheles*. Usually females of the coprophilous *Macrocheles* display phoretic association with insects, particularly dung beetles (Evans and Hyatt 1963, Costa 1967). They are predators. The predatory habit of *Macrocheles* is an asset which may contribute to their role as biological control agents in reducing population of dung-breeding flies (Krantz 1983). Phoretic *Macrocheles* are little known in India. Evans and Hyatt (op. cit.) described 4 such new species, namely *ceylonicus*, *krantzi*,

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malabaricus and *nevernalis* from the Indian subcontinent collected off coprid beetles in the collections of the British Museum. They have made a significant contribution to the knowledge of the genus by adding 38 new species on a global basis.

This paper is based on material collected from beetles in the collections of the Entomology Department, University of Agricultural Sciences, Bangalore, Karnataka (South India). The present contribution embodies the descriptions of two new species.

The types would be deposited in the National Zoological Collections, Zoological Survey of India, Calcutta.

Macrocheles punctovariata sp. nov.

FEMALE (Figs. 1-10): Dorsal shield (Fig. 1) 735-825 µm long, 390-480 µm wide, faintly reticulate and bearing 28 pairs of setae. Verticals, j_1, with adjacent insertions, plumose distally; j_4 and z_4 distally pectinate; remaining dorsal setae simple.

Sternal shield (Figs. 2-5) approximately as long as wide, with a well defined series of punctate lines. *L.m.t.* distinct, undulating or procurved; *l. ang.* usually concave medially; *l.o.p.* distinct joining *l.m.t.* in majority of specimens and sometimes arched anteriorly forming a parallel punctate line to that of *l.m.t.* Metasternal shields ovoid, well separated from sternal shield; metasternal setae simple and almost as long as sternals III. Genital shield rounded anteriorly, truncate posteriorly, with a pair of smooth fairly long genital setae inserted posteriorly. Ventrianal shield (Fig. 6) subtriangular, rounded laterally and longer than broad; with a series of seven arched punctate lines traversing the shield between preanal setae I and adanals; preanals, adanals and postanal simple. Metapodals represented by a pair of small weak sclerites posterior to insertions of coxae IV. Stigmata laterad of coxae III-IV, peritremes extending anterodorsally to a point more than half of distance between setal insertions of z_1 and j_1.

Gnathosoma (Fig. 7) with five rows of deutosternal denticles. Tectum as shown in Fig. 8. Movable digit of chelicera (Fig. 9) tridentate, middle one being larger; fixed digit bidentate; dorsal seta simple; cheliceral brush more than half the length of movable digit.

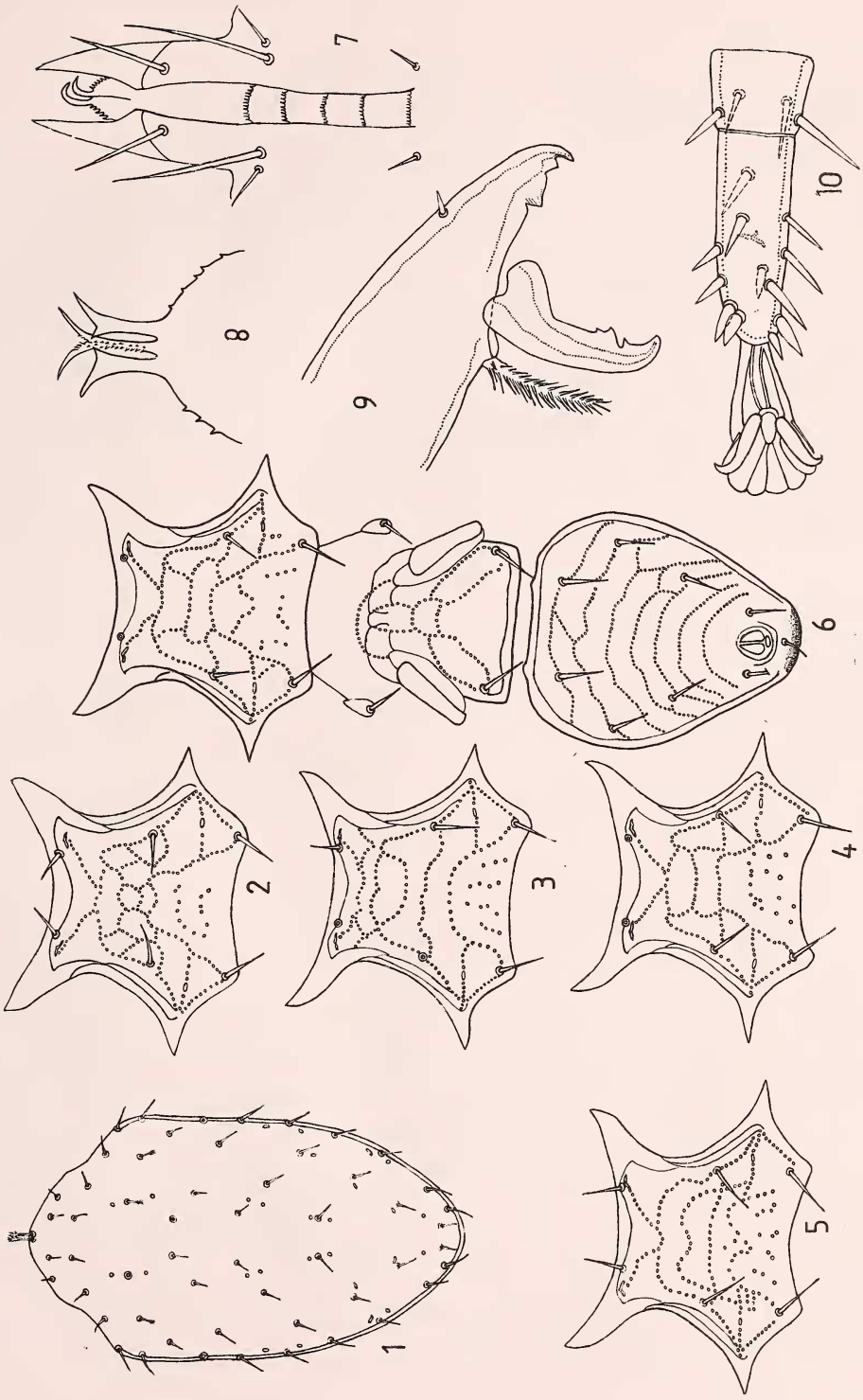
Approximate lengths of legs (excluding pretarsi); I–540 µm; II – 495 µm; III – 480 µm; IV - 690 µm. Tarsus I (105-135 µm) slightly longer than tibia I (90-120 µm); tarsus II (Fig. 10) 105-150 µm; tibia II 60-90 µm. Genu IV with six setae of which av is plumose distally.

MALE: (Figs. 11-15): Dorsal shield (Fig. 11) 555-600 µm long, 360-390 µm wide, weakly reticulate, chaetotaxy as in female excepting setae r_2 being distally plumose.

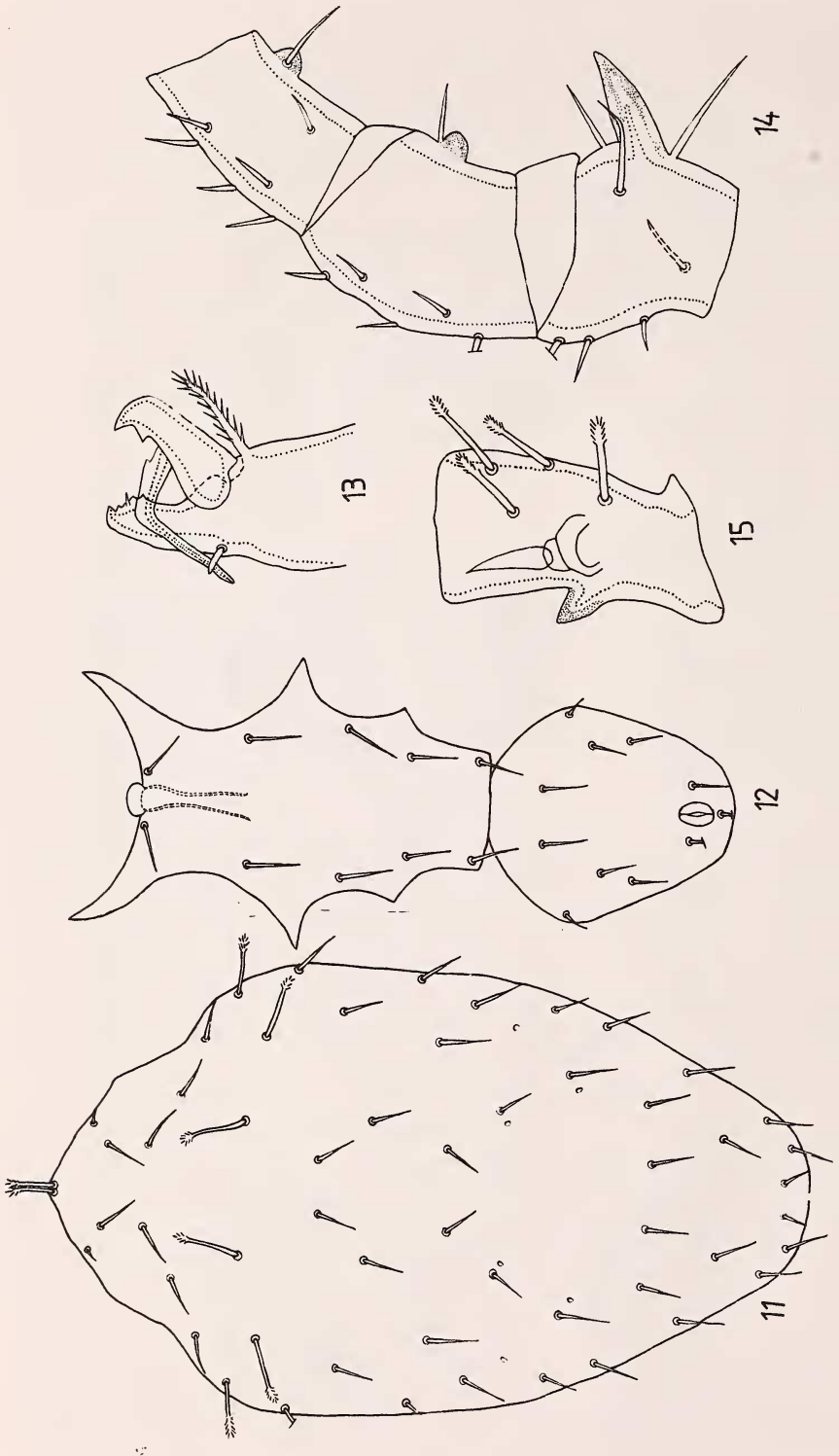
Genital orifice presternal in position. Sternitigenital shield (Fig. 12) 285 µm long, 150 µm wide, without ornamentation and with five pairs of smooth sternitigenital setae (sternal, metasternal and genital setae of female). Ventrianal shield (Fig. 12) 195 µm long, 180 µm wide, unornamented, with 4 pairs of smooth preanal setae including an additional pair of marginal setae; adanal setae simple and long; postanal smooth. Stigmata, peritremes similar to those of female.

Gnathosoma similar to that of female. Fixed digit of chelicera (Fig. 13) tridentate; movable digit unidentate and bearing distally a long spermatophoral process; cheliceral brush extending more than half the length of movable digit.

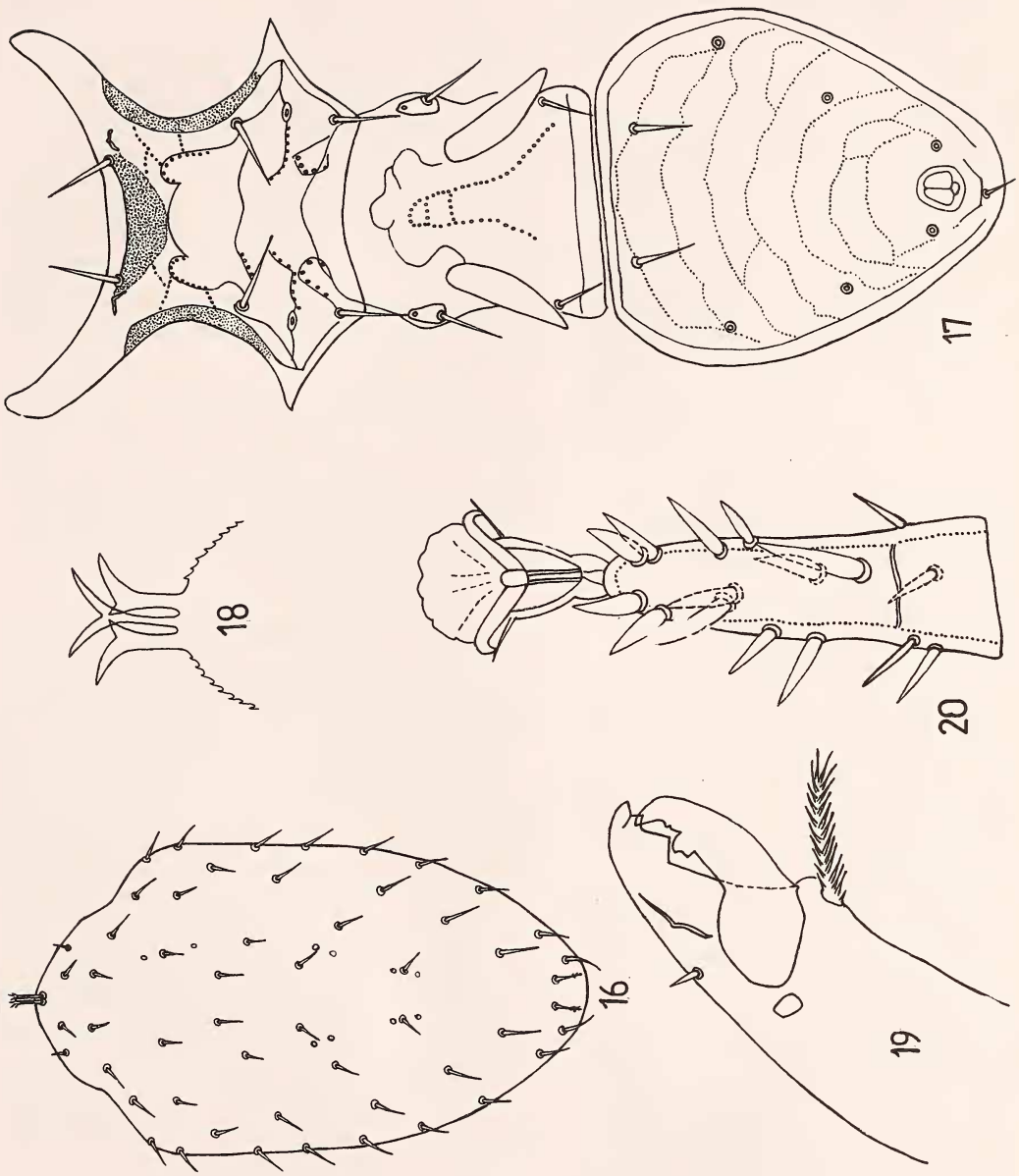
Femur, genu and tibia II spurred (Fig. 14); femur IV (Fig. 15) also spurred. Genu IV with six setae of which al, ad_1 and pd_1 distally plumose.



Figs. 1-10. *Macrocheles punctovariata* sp. nov. Female
1. Dorsum; 2-5. Variation in sternal ornamentation; 6. Venter; 7. Gnathosoma; 8. Tectum; 9. Chelicera; 10. Tarsus of leg II.



Figs. 11-15: *Macrocheles punctovariata* sp. nov. Male
11. Dorsum; 12. Venter; 13. Chelicera; 14. Femur, genu and tibia of leg II; 15. Femur IV.



Figs. 16-20: *Macrocheles sisiri* sp. nov. Female
16. Dorsum; 17. Venter; 18. Tectum; 19. Chelicera; 20. Tarsus of leg II.

Material examined: *Holotype:* FEMALE, Karnataka : Bangalore, ex *Heliocepris* sp., collector and collection date unstated. *Allotype:* MALE, collection data as holotype. *Paratypes:* 7 Females, 1 Male, collection data as above.

Distribution: INDIA: Karnataka.

Remarks: This species superficially resembles *M. carteri* Evans and Hyatt in the nature of ornamentation of the ventral shields. But *M. punctovariata* is interesting in exhibiting considerable intraspecific variation in the sternal shield ornamentation unlike that of *carteri* and also in possessing plumose dorsal setae (j_4 & z_4) which are simple in *carteri*. Since males are non-photrectic, they are very rarely found on beetles. Costa (1967) collected a single male of *M. saceri* Costa from *Scarabaeus sacer* in Israel. Two males of *punctovariata* have been found attached to the coxal region of the beetle (*Heliocopris* sp.).

Macrocheles sisiri sp. nov.

FEMALE (Figs. 16-20): Dorsal shield (Fig. 16) 705-795 µm long, 405-480 µm wide, granular and reticulate and with 28 pairs of setae. Verticals, j_1, pilose distally with their bases being closely apposed; J_5 pectinate or smooth; other dorsal setae simple.

Sternal shield (Fig. 17) granular and with punctate liniae. *L.m.t.* undulating; *l.o.p.* extending almost to the centre of the shield; *l.a.t.* and *l. ang.* porous; *areae punctatae* present; sternal setae fairly long but never reaching insertions behind them and simple. Metasternal shields elongate, each with a simple seta sub-equal to sternals. Genital shield granular, truncated posteriorly, ornamented with punctate lines medially; genital setae in lateral corners and smooth. Ventrianal shield (Fig. 18) 210-270 µm long, 180-210 µm wide, granular, subtriangular, longer than broad, ornamented with punctate transverse lines; ventrianal setae smooth. Metapodal shields circular, adjacent to coxae IV, each with a simple seta. Ventrianal integument with simple setae, nearly equal to preanals. Stigmata normal for genus, peritremes extending anteriorly half way between setal insertions of z_1 & j_1:

Gnathosoma with five rows of deutosternal denticles. Tectum as shown in Fig. 18. Movable digit of chelicera (Fig. 19) with a median bicuspid tooth and I small tooth at apex; fixed digit bidentate, proximal tooth large; cheliceral brush nearly half as long as movable digit.

Approximate lengths of legs (excluding pretarsi): I - 495 µm; II - 465 µm; III 450 µm; IV - 600 µm. Tarsus I (105-135 µm) longer than tibia I (90-105 µm). Tarsus II (Fig. 20) 120-135 µm; tibia II (75-90 µm). Genu IV with six simple setae.

MALE: Unknown.

Material examined: *Holotype* : FEMALE, Karnataka : Bangalore, ex *Copris* sp., collector and collection date unstated. *Paratypes:* 18 Females, same data as holotype.

Distribution: INDIA: Karnataka

Remarks: The general facies of *M. sisiri* are similar to *Macrocheles boxi* Evans & Hyatt. Differences in the nature of ornamentation of the sternal shield, namely absence of *linea angulata*, absence of *areae punctatae*, shape of *linea arcuata*, shape and ornamentation of genital shield in *M. boxi*, are, however, sufficient to warrent separation of the latter from the former.

This species is named in honour of Dr Sisir Kumar Bhattacharyya, Joint Director, Zoological Survey of India, Calcutta.

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NEW AND NOT KNOWN APHIDS (HOMOPTERA : APHIDIDAE) FROM HIMACHAL PRADESH, INDIA[1]

D.K. BHATTACHARYA[2]

(With four text-figures)

Four species of aphids (Homoptera : Aphididae) are recorded from the State of Himachal Pradesh, India. Among these, one, *Eumyzus simlaensis* is new and three species, *Anoecia nemoralis*, *Myzus formosanus* and *Pemphigus mordvilkoi* are new to Himachal Pradesh.

INTRODUCTION

Altogether 251 species of aphids are so far known from Himachal Pradesh, Chowdhury *et al.* (1969), Bindra and Sekhon (1969), Ghosh *et al.* (1969), Chakrabarti *et al.* (1970, 1974), Bhalla (1971), Raychaudhuri *et al.* (1980), Das *et al.* (1981), Chakrabarti and Bhattacharya (1982) and Ghosh (1986).

In this paper four more species are added to the list and the total number of species from the area stands at 255. Among these newly recorded species one, *Eumyzus simlaensis* is new to science. The rest are recorded for the first time from the State.

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1. **Eumyzus simlaensis** sp. nov.
(Figs. 1-4)

Apterous viviparous female: Body 1.41-1.48 mm long and 0.76-0.78 mm wide. Head brown strongly spinulose both dorsally and ventrally; frons moderately developed with well developed but diverging lateral frontal tubercles; dorsum with 5-6 pairs of short hairs with bluntish apices; longest hair on vertex 0.011-0.018 mm long and 0.5-0.6 times as long as basal diameter of antennal segment III. Antennae 6-segmented with basal two segments little darker than head, but rest of the flagellum pale, 0.60-0.70 times as long as body; segment I and II little scabrous and with 6 and 5 hairs, longest one on segment III 0.50-0.60 times as long as basal diameter of the segment, flagellum gradually and distinctly imbricated apicad; processus terminalis 3.50-3.70 times as long